3G Wireless
The Next Generation of Broadcast Technology
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Before the Federal Communications Commission,
Washington DC 20544

May 25, 2004.
In the Matter of

Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2GHz for use by the Mobile-Satellite Service	)))	ET Docket No. 95-18

Background:
To most people, the 2 GHz BAS band is only occupied by ENG users, i.e. News trucks and helicopters transmitting news material back to a TV Station. There is another very prevalent use of this band for wireless cameras. For example every golf tournament, car race, and other sporting event that a viewer watch's on TV has many wireless cameras that the TV Networks and Production Companies use to enhance their coverage of the event. All these systems are provided by outside vendor companies like us. TV Networks and Production companies are getting out of the business of owning and managing TV Production hardware, and are increasingly looking to outside vendors to provide this service, particularly specialist camera systems. By TV Networks, I mean ABC, ESPN, NBC, CBS and FOX. Our company has an LTTS license to provide these services, and as such, any changes to the rules regarding the BAS 2GHz band directly affects my company's ability to provide this service to my clients.

My comments here may extend beyond the specific issues of ET Docket 95-18, the reallocation of the 1990 to 2110 GHz BAS band, however I feel these additional comments are relevant.

Submission:
As an operator in this band, if 25 MHz of spectrum is being taken away from broadcasters in the 2GHz BAS band, then additional spectrum to replace this should be allocated by the FCC. The spectrum I see that would present the least technical impact to broadcasters is in the Fixed Microwave Services band, just above the BAS band. The new band would be 2025 to 2145.

The present plan to re-allocate the BAS band involves reducing the occupied channel width to 12 MHz, and to achieve this by the introduction of new technology, such as COFDM digital microwave systems, for Standard Definition television that has an occupied channel width of 8 MHz, but with a 1 MHz guard band on either side, a channel spacing of 10MHz can be achieved, i.e. compared to an analog NTSC microwave channel that occupies 17MHz. The major problem with any digital microwave system has been the delay introduced by the video compression technology that has to be employed. If a wireless camera is used alongside a camera that is connected by cable, for example (triax), in a live sports telecast situation, the additional

delay of 1 to 10 frames (depending on equipment) has meant that the digital COFDM camera has not won immediate universal acceptance. Viewers at home don't want to see a golf ball go in the hole twice. Clients prefer the analog microwave systems, because there is no delay. The delay is not a problem in a News situation, where there is only one camera, or all camera's are delayed by the same amount.

In addition, there may be an assumption that since this new technology is digital that it will coexist on a channel with other digital services. It does not. Experience has shown that COFDM will NOT work reliably say in the 2400 to 2483 MHz band. No company that knows what it is doing would supply a wireless camera service to a Network operating in this band. There is zero tolerance for any picture disturbance when the camera being supplied to a client, is being used live on a Network. The rule that has to be adopted is that you need to be able to operate on a coordinated channel, clear of any other users in the area of operation. Analog microwave transmissions in this band are also affected by these license free digital services.

High Definition digital COFDM systems will probably occupy two adjacent 8MHz channels, with a 1MHz guard band in between them (or some similar wide bandwidth requirement). HD systems require a much higher data rate, i.e. 25 Mb/s after compression, and therefore require a greater bandwidth to carry this information. The new BAS channel band plan does not allow for any HD microwave channels, as the proposed channel widths are not sufficient, and the number of channels that would be achieved with perhaps 17 MHz channel widths would be unacceptable. On the one hand the FCC is insisting that HD be made available to the home, but on the program acquisition side, there is no allowance for HD channels for ENG, or any other Sports or News Production. It has to be expected that a channel width in the order of 17 MHz (same as analog) will be required for HD transmissions, particularly when low delay is demanded.

Typically at a golf tournament vendors like ourselves may be required to provide 6 to 8 analog wireless camera's, or more, each requiring one 17 MHz channel. As a specific example our company is contracted to provide up to 6 wireless cameras at the PGA golf tournaments in Los Angeles, New York and Washington DC for one of our clients. We are not able to coordinate six 17 MHz analog channels from the local SBE coordinator. These markets are so busy with News activity on all of the 2GHz BAS channels that the coordinator cannot give you one channel to use. At one time there were in addition to the seven 2 GHz BAS channels, three channels at 2.5 GHz, i.e. specifically 2458, 2475 and 2492, (channels 8,9 and 10). These are IV Video Production channels. 2492 was taken away, and the band 2400 to 2483 is now unusable because of all the no license devices that have flourished. It was also possible to get channels in the 2.3 GHz band, by getting an STA and obtaining AFTRCC coordination. These channels were 2316, 2333, 2350, 2367 and 2384. Three of these channels have gone to Satellite radio, and it is only possible to coordinate the top two channels.

The FCC won't allow experimental licenses in any other bands, because the Office of Engineering and Technology say's that broadcasters should apply for a rule change and have spectrum allocated to them.

As a result of all of these changes, it is getting increasingly more difficult to provide a service to our clients.

In addition to the 2 GHz BAS band for broadcasters for News activity, there needs to be spectrum allocated below 3GHz for Sports production. The 2500 to 2690 MHz band for ITFS and MMDS services is very inefficiently used. Also, the 2.5 GHz band is commonly used in Europe, and other countries. It would make sense for the FCC to align the allocation for these services with the rest of the world, to allow manufacturers to provide systems in similar bands.

Frequencies above 3 GHz are not suitable for the type of wireless applications that companies like we engage in. For example, at the Sydney Olympics, the uplink to a helicopter repeater from the motorcycle cameras covering the Triathlon was on 3.3 GHz. The leaves on overhanging trees attenuated the signal so much that for large parts of the course, the motorcycle cameras could not be used. Obviously this effect becomes worse at higher frequencies.

It can be expected that the demand for digital wireless cameras will increase, as has the demand for wireless phones, and wireless computer access. There will not be enough channels to cope with this increased demand. News operations in every market will swamped with unlicensed operators using equipment in the 2GHz BAS band. Equipment is being sold now to operators without licenses.

To give an example of the bandwidth required to do some sporting events, the last America's cup yacht race, which was held in New Zealand, and was broadcast on two Networks in the US, required twenty 10 MHz channels for use by digital COFDM systems in the 2.7 to 2.9 GHz band. This enabled video and audio from every competing yacht to be brought to many living rooms around the world. Another every day example in the US is car racing. It requires a lot of spectrum that is currently not allocated for broadcast use, to provide in car cameras in many cars simultaneously, to viewers living rooms.

Having been involved in the last four Olympic Games, and specifically, RF planning for the last two, if an Olympic Games are to be held in the US in the future, especially a summer Olympics, there will be a huge demand for wireless camera systems. The present allocation of spectrum for broadcasters will not cope with the demand.

Summary:
I want to draw the FCC's attention to the present situation for companies like ourselves that provide an important service to our clients, and in turn serve the publics interest by providing better sports coverage. The amount of frequency spectrum available to us and other broadcasters to provide what the public has come to expect is being alarmingly reduced. The re-channeling of the 2GHz BAS band (ET Docket 95-18) is just one of the many initiatives that is causing this.

I respectfully submit the above for your consideration.

Yours sincerely,

Greg Robinson
President
3G Wireless, LLC